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NEW LAND MOLLUSKS OF THE JAPANESE EMPIRE.

BY H. A. PILSBRY AND Y. HIRASE.

A number of new forms chiefly collected by Mr. Nakada in Kyushu and the Ryukyu chain last winter are herein described. In working up these islands many hardships and dangers were encountered, not the least being the abundance of venomous snakes locally called "*Habu*." The malacological results have been most gratifying, as we now have a fair knowledge of the snails of all the larger islands and many of the smaller ones. Mr. Nakada has now been sent to China.

CYCLOPHORIDÆ.

Cyclophorus turgidus miyakoensis n. subsp.

This form differs from *C. turgidus* by its wider umbilicus, smaller aperture, slightly expanded and obtuse but not thickened lip, which is white. It differs from *C. kikaiensis* by the non-duplicate peristome and large size. It is related also to *C. elegans* Mildf., from the Marble Rocks, Kuang-tung, China. The coloration varies from yellowish-white with numerous spiral lines and bands of brown spots, to dark chestnut brown with interrupted, irregular whitish bands on the base and whitish flames below the suture.

Alt. 17.5, diam. 22 mm.; aperture 11 x 11 mm., including peristome.

Miyako, in the Southwestern group of the Ryukyu Islands. Types No. 83,886, A. N. S. Phila., from No. 983 of Mr. Hirase's collection.

Pupinella oshimæ yorojimana n. subsp.

Shell similar to *P. oshimæ*, but smaller, with the lip reddish-orange.

Length 9.2 to 9.8, diam. 4.3 to 4.8 mm.

Yoro-jima, Ōsumi. Types No. 89,951, A. N. S. Phila., from No. 1,214a of Mr. Hirase's collection.

Cyclotus taivanus peraffinis n. subsp.

Shell similar to *C. taivanus*, but with the last whorl a more slender tube, the aperture in consequence being smaller. Surface glossy, finely striatulate vertically; yellow, closely marked with irregular, often interrupted or dislocated narrow red-brown streaks.

Alt. 8.5, diam. 14; alt. and diam. aperture with peristome 5.7 mm.; width of umbilicus 4.5 mm.

Yaeyama, Ryukyu Islands. Types No. 84,787, A. N. S. Phila., from No. 612a of Mr. Hirase's collection.

***Diplommatina tokunoshimana errans* n. subsp.**

Shell similar to *D. tokunoshimana* except that the whorls of the conical portion of the spire, and the back of the penultimate whorl are sculptured with widely spaced threads. On the front of the penultimate and on the last whorl the thread-striae are much closer, though neither so close or so fine as in *tokunoshimana*.

Tamina, Kunchan, Ryukyu. Types No. 89,955, A. N. S. Phila., from No. 1349 of Mr. Hirase's collection.

In *D. tokunoshimana* and *D. t. errans* the spout or sinus at the foot of the columella is developed more strongly than in *D. paxillus* Gredler, of China; the columella is straighter, and the mouth is more irregular in shape, not approaching circular as in *paxillus*, the columellar margin being vertical and straight. The Formosan *D. hungerfordiana* has a much shorter cone than *tokunoshimana*.

***Diplommatina tosana kureana* n. subsp.**

Differs from *D. tosana* by the longer, straightly conic upper half of the shell, which tapers regularly from the penultimate whorl, while in *D. tosana* the next earlier whorl is larger, and the spire convexly conic. There is also nearly a whorl more, almost 7 in *kureana*, and the columellar margin of the aperture is more straightened. The constriction is above or barely behind the outer lip, as in *tosana*; the palatal plica is long, covered by the parietal callus, and the columellar lamella strong and horizontal.

Length 3, diam. 1.7 mm.

Kure, Tosa. Types No. 89,950, A. N. S. Phila., from No. 1,027b of Mr. Hirase's collection.

***Diplommatina tosana nogawana* n. subsp.**

Shell smaller than *D. tosana*, composed of $6\frac{1}{2}$ very convex whorls, the penultimate swollen and predominating, very finely thread striate, those above regularly tapering, more distantly thread-striate, the last whorl smaller, with the striae more oblique and more distant than on the penultimate, well rounded, the suture slowly ascending to the lip. *Constriction median* above the aperture; the palatal plica is long, lying chiefly in front of the parietal callus. Peristome well expanded, with a narrow "collar" close behind it. Parietal callus small, with distinctly raised edge. Columellar lamella strong.

Length 2.7, diam. 1.4 mm.

Nogawa, Tosa. Types No. 89,962, A. N. S. Phila., from No. 1,026b of Mr. Hirase's collection.

The special features of this form may entitle it to specific rank, but for the present its relationship to *D. tosana* may be kept in view by the use of a trinomial designation.

Palaina (*Adelopoma*) **paucicostata** n. sp.

Shell sinistral, perforate, cylindric-conic, white or pale yellow, thin, sculptured with delicate widely spaced thread-like riblets, about 20 on the last whorl. Whorls $5\frac{1}{2}$, very convex, the earlier ones rapidly increasing, the last two about equal. Last whorl well rounded peripherally and basally, having a weak, inconspicuous constriction above the columella. Aperture nearly circular with continuous peristome, not dilated on the parietal wall. Peristome reflexed, with an inner rim; columellar tooth small and deeply situated.

Length 2.2, diam. 1.1 mm.

Nanae, Ojima, Yesso. Types No. 89,813, A. N. S. Phila., from No. 1,311, of Mr. Hirase's collection.

This species is larger than *P. pusilla* (*Diplommatina pusilla* Martens) or its variety *omiensis* Pils., with much more widely-spaced riblets.

TRUNCATELLIDÆ.

Truncatella japonica n. sp.

Shell of the usual cylindric, truncate shape, $3\frac{1}{2}$ whorls remaining; of a light reddish color. Sculpture of nearly straight rounded ribs about as wide as their intervals, 28 or 30 on the last whorl. There is usually a small crest behind the lip, which is narrowly expanded. Aperture ovate.

Length 5.8., diam. 2.3 mm.

Length 5.6, diam. 2.1 mm.

Futami, Ise. Types No. 89,942, A. N. S. Phila., from No. 1,319 of Mr. Hirase's collection.

This species is related to *T. kiusiuensis*, from which it differs in the smaller size, smaller and more numerous ribs, there being about 30 on the last whorl, while *T. kiusiuensis* has about 20; and the rib behind the lip is not so large. *T. pfeifferi* Marts., described from Japan without more exact locality, is larger and more robust, 6 x 3 mm., and is sculptured "with nearly straight riblets equal to their intervals, and evanescent on the last whorl." It has not been figured, and was collected by Siebold. Mr. Hirase has found no *Truncatella* agreeing with the characters quoted. The province Ise is on the East coast of the main island. The locality is far north for a *Truncatella*.

HELICIDÆ.***Eulota mercatoria iejimana* n. subsp.**

Shell narrowly umbilicate, solid, compact, rich chestnut, paler near the suture and umbilicus, and with a chocolate-brown band at the periphery, with a whitish band above and below it. Surface somewhat shining, rib striate above, nearly smooth below. Spire convexly-conoid. Whorls about 6, convex, very slowly widening, the last rounded peripherally, very slightly descending in front; base convex. Aperture oblique, lunate. Peristome flesh-tinted or whitish, well reflexed, thickened within, arcuate throughout; in a basal view the basal margin is slightly arched forward.

Alt. 22, diam. 30 mm.

Alt. 20, diam. 29.5 mm.

Iejima, Ryukyu. Types No. 89,902, A. N. S. Phila., from No. 1,352 of Mr. Hirase's collection.

This peculiar little form differs from *Eulota mercatoria* by its more globose shape, more closely coiled whorls, wider peristome, etc. It resembles also *E. caliginosa*, but the base is more convex and the basal lip is arcuate. It might be considered a distinct species.

***Eulota connivens iheyaensis* n. subsp.**

Shell differing from *E. c. phæogramma* by its strong thread-like rib-striae both above and below.

Alt. 16, diam. 22 mm.

Alt. 15, diam. 21 mm.

Iheya-jima, Ryukyu. Types No. 89,873, A. N. S. Phila., from No. 1,353 of Mr. Hirase's collection.

***Eulota* (Plectotropis) *tokunovaga* n. sp.**

Shell openly umbilicate, shaped much like *E. mackensii*, being low-conic above, convex beneath; *thin and light, almost fragile*; chestnut colored or sometimes pale dull green. Surface lusterless, irregularly marked with growth lines, and where unrubbed, bearing sparse linear adnate cuticular threads; peripheral fringe rather short and sparse in young shells, generally absent in adults. Under the dull outer coat the surface is *closely striate spirally*, both above and below. Whorls $6\frac{1}{2}$ to $6\frac{3}{4}$, slightly convex, the last not descending in front, strongly carinate peripherally, convex beneath. Aperture oblique, trapezoidal. Peristome thin, narrowly expanded, the basal and columellar margins narrowly reflexed. Parietal callus very thin.

Alt. 15, diam. 29 mm.

Alt. 14.7, diam. 28 mm.

Alt. 15, diam. 26.3 mm.

Alt. 12.7, diam. 25 mm.

Tokunoshima, Ōsumi. Types No. 87,501, A. N. S. Phila., from No. 1,211 of Mr. Hirase's collection.

This species, while related to *E. mackensii*, is smaller and much more delicate, almost to be called fragile. The cuticular processes are shorter; the surface when rubbed is seen to be closely and distinctly striate spirally, and the base is not so angular around the umbilicus. It is a much thinner, weaker shell than *E. vulgivaga*.

The *Ganesella largillierti* group consists of richly colored and beautiful snails, confined, so far as we know, to the Ōshima and Okinawa groups—the central islands of the Ryukyu chain. The following forms may be recognized:

- I.—Surface with *extremely weak* spiral striæ or *none*,
G. largillierti ("Phil." Pfr.).
- II.—Spiral striation minute but distinct.
 - a*—Spire straightly pyramidal; altitude exceeding the diameter,
G. adelinæ Pils., Ōshima.
 - a*¹—Spire obtuse; diam. exceeding the alt.,
G. sororcula Pils., and varieties.
 - b*.—Spire conoidal; columella nearly vertical; diam. about
 2 mm. greater than the alt.,
G. sororcula, typical; Kikai.
 - b*².—Spire lower; columella more sloping; 21 x 26 to 17 x 21
 mm., *G. s. tokunoshimana* P. and H., Tokunoshima
 and Ōshima.
 - b*³.—Still more depressed, columella oblique; size about 21 x 28
 mm., *G. s. okinoerabuensis* P. and H., Okinoerabu-
 shima.
 - b*⁴.—Like typical *sororcula*, but with less conic spire and
 nearly closed umbilicus,
G. s. iheyensis P. and H., Iheyajima.

***Ganesella sororcula okinoerabuensis* n. subsp.**

Narrowly umbilicate, broad and low-conic, light yellow with a broad purplish-brown band immediately above and another a short distance below the periphery. Spire bicolored, the lower half of the penultimate whorl purple-brown, the upper half yellow; on the next earlier whorl purple replaces the yellow; and the upper two whorls are dark purple-brown. The surface is finely striate spirally.

Alt. 22, diam. 28 to 28.5 mm.; whorls 5½.

Okinoerabushima, Ōsumi. Types No. 89,996, A. N. S. Phila., from No. 1,337 of Mr. Hirase's collection.

***Ganesella sororecula iheyaensis* n. subsp.**

Shell globose-trochiform, minutely obliquely perforate, pale yellowish (or white when denuded of the thin cuticle) with three red-brown bands, one at the periphery, one above and one below it, the latter sometimes conrescent with the peripheral; there is also a dark subsutural line, and a small umbilical dark area. Spire convex-conic with obtuse apex; whorls $5\frac{1}{2}$, the last angular peripherally. Basal lip thickened within.

Alt. 19.5, diam. 22 mm.

Alt. 18.5, diam. 21.3 mm.

Iheyajima, Ryukyu. Types No. 89,981, A. N. S. Phila., from No. 1,355 of Mr. Hirase's collection.

***Moellendorffia eucharistus* (Pils.).**

Originally described as a *Chloritis*, but the cord across the parietal wall, the shape of the aperture, and the vestigial sulci behind the lip in some specimens, show that the species belongs to the subgenus *Trihelix* of the genus *Moellendorffia*.

***Moellendorffia eucharistus tokunoensis* n. subsp.**

Shell larger than *eucharistus*, the spire and last whorl wider, whorls less convex above; color darker, chocolate brown. Whorls $4\frac{3}{4}$, the first very glossy and smooth.

Alt. 11, diam. 23.7 mm.

Alt. 10.5, diam. 22 mm.

Tokunoshina, Ōsumi. Types No. 90,048, A. N. S. Phila., from No. 1,207 of Mr. Hirase's collection.

***Moellendorffia eucharistus diminuta* n. subsp.**

Shell smaller than *eucharistus*, with more deeply sunken and narrower spire; whorls $4\frac{1}{2}$, more convex above than in *eucharistus*. There is a slight indentation or flattening above the periphery behind the aperture, and an oblique excavation behind the columellar lip, in the positions of the pits in *Trihelix*, and evidently homologous with them.

Alt. 7.2, diam. 13.8 mm.

Alt. 6.3, diam. 12.8 mm.

Koniya, Ōshima, Ōsumi. Types No. 90,049, A. N. S. Phila., from No. 354a of Mr. Hirase's collection.

***Pupisona japonicum depressum* n. subsp.**

Shell similar to *P. japonicum*, but decidedly more depressed.

Alt. 1.1, diam. 1.3 mm.

Mikage, Settsu. Types No. 89,993, A. N. S. Phila., from No. 1,321 of Mr. Hirase's collection.

ZONITIDÆ.

The *Zonitidæ* of the Ogasawara or Bonin Islands, exclusive of *Hirasea* and related forms, may be determined by the following key. The generic relations of part of the forms are uncertain, since we as yet know little of the extent to which convergent evolution has moulded shell-form in this family.

- I.—Shell elevated, trochiform, as high as wide, 5 x 5 mm.; whorls $7\frac{1}{2}$, the last strongly angular, *Kaliella ogasawarana* Pils.
- II.—Shell depressed, the spire convex or low-conic.
 - a.—Columella thin, reflexed.
 - b.—Very glossy and densely striate spirally above and below; periphery not carinate, obtusely subangular.
 - c.—Shell narrowly, obliquely perforate; 3 x 4.5 mm., *Macrochlamys chaunax*.
 - c².—Shell narrowly umbilicate; 2 x 3.2 mm., *Macrochlamys lineatus*.
 - b¹.—Periphery strongly carinate.
 - c.—Surface dull, minutely, irregularly granulate, *Otesia chichijimana*.
 - c¹.—Surface glossy, obliquely wrinkled and spirally, striate, *O. hahajimana*.
 - a¹.—Columella calloused within, with a low tooth or nodule. Spiral striæ wanting or excessively faint, *Microcystina*.
 - b.—Periphery rounded, or very weakly subangular in front; surface very glossy.
 - c.—Outer lip thin; whorls 5; about 4 x 6.5 mm., *Microcystina hahajimana* Pils., 1902.
 - c¹.—Outer lip thin; whorls about $4\frac{3}{4}$; smaller, about 2.9 x 5 mm., *M. hahajimana jejuna*.
 - c².—Outer lip thickened within; whorls $4\frac{1}{2}$; 2.8 x 5 mm., *M. hahajimana pachychilus*.
 - c³.—Outer lip thin; spire quite convex; aperture a narrower crescent; whorls $4\frac{1}{2}$; about 2.7 x 4 mm., *M. hahajimana kitaiwojimana*.
 - b¹.—Periphery with an inconspicuous but rather acute angle in front, elsewhere rounded; whorls $4\frac{1}{2}$; 2.2 x 4 mm., *M. anijimana*.

***Microcystina hahajimana* Pils.**

This species was described in 1902 from specimens from Hahajima Ogasawara, the types being 82,606, A. N. S. Phila., No. 803 of Mr. Hirase's collection. It seems to be a typical *Microcystina*, having a calloused, obtusely nodular columella, and a glossy surface which is not spirally engraved. Numerous closely related forms have subsequently been received from various islands, as follows:

***M. hahajimana jejuna* n. subsp.**

Smaller than *hahajimana* and typically with the spire distinctly lower, though still quite convex. There is a fraction of a whorl less.

Alt. 2.8, diam. 5 mm.

Imotojima. Types No. 84,955, A. N. S. Phila., from No. 803e of Mr. Hirase's collection.

Similar specimens, but with the spire a little higher, more like typical *M. hahajimana*, were taken on Nakanoshima (803c of Mr. Hirase's collection), the largest measuring alt. 3.3, diam. 5.2 mm. The spire is about as high as in typical *hahajimana*. Others came from Anijima (No. 803a of Mr. Hirase's collection), 3 x 5 mm.; and another lot, of the same size, from Anejima (803d).

***M. hahajimana kitaiwojimana* n. subsp.**

Smaller than any of the preceding, with the spire elevated as in typical *M. hahajimana*. Aperture more narrowly crescentic. Whorls $4\frac{1}{2}$.

Alt. 2.7, diam. 4 mm.

Kita-iwo-jima, Ogasawara. Types No. 89,867, A. N. S. Phila., from No. 803f of Mr. Hirase's collection.

***M. hahajimana pachychilus* n. subsp.**

Similar to typical *M. h. jejuna* in shape, the spire being more depressed than in *M. hahajimana*; outer and basal margins of the peristome *distinctly thickened within*. Whorls $4\frac{1}{2}$.

Alt. 2.8, diam. 5 mm.

Mukojima, an islet near Hahajima. Types No. 84,949, A. N. S. Phila., from No. 803b of Mr. Hirase's collection.

***Microcystina anijimana* n. sp.**

Shell minutely perforate, depressed, convex above and below, thin pale brown, somewhat transparent. Surface smooth, with no trace of spiral striæ. Whorls nearly $4\frac{1}{2}$, but slightly convex, the suture linear, with a narrow transparent margin below; last whorl rather acutely angular in front of the aperture, elsewhere rounded. Base convex, impressed around the perforation. Aperture slightly oblique, crescentic, the outer and basal margins thin, columellar margin slightly thickened within, with a very weak, low median nodule.

Alt. 2.2, diam. 4 mm.

Anijima, Ogasawara. Types No. 83,298, A. N. S. Phila., from No. 803a of Mr. Hirase's collection.

Readily distinguished from the smaller forms of *M. h. jejuna* by the angulation of the periphery in front. A single specimen of apparently

the same form was sent from Nakanojima. It differs from *Macrochlamys lineata* by the smooth surface, without spiral striation.

***Macrochlamys lineatus* n. sp.**

Shell narrowly umbilicate, depressed, convex above and below, thin, amber colored, glossy; closely and rather deeply striate spirally above and below. Whorls $4\frac{1}{2}$, hardly convex, the last weakly and obtusely subangular peripherally, convex below. Aperture but slightly convex, lunate, the lip thin and fragile; columellar margin thin, triangularly reflexed at the insertion.

Alt. 2, diam. 3.2 mm.

Nakanoshima, Ogasawara. Types No. 86,489 and 89,868, A. N. S. Phila., from No. 1,177 of Mr. Hirase's collection.

A very much smaller and more depressed shell than *M. chaunax*, and differing from other Ogasawaran *Zonitidae* by its spiral sculpture.

***Otesia chichijimana* n. sp.**

Shell obliquely perforate, low-conic above, convex below, acutely carinate at the periphery; thin, brown, not glossy, but with a dull silken luster. Sculpture of irregular growth-wrinkles and a very fine, close irregular granulation. Spire low-conic, with convex outlines and an obtuse apex. Whorls $4\frac{1}{2}$, but slightly convex, the last two with a shallow furrow above the keel. Base convex, impressed at the axis, paler in the middle. Aperture oblique, the lip thin, subangular at the termination of the keel, basal margin narrowly dilated and reflexed above.

Alt. 3.2, diam. 5.5 mm.

Chichijima, Ogasawara. Types No. 83,223, A. N. S. Phila., from No. 865c of Mr. Hirase's collection.

***Otesia hahajimana* n. sp.**

Shell obliquely perforate, conoid-convex above, convex beneath, carinate at the periphery, thin, amber-brown, glossy. Sculpture of strong irregular growth-wrinkles and striæ, stronger and more conspicuous above, and comparatively coarse spiral striæ. Spire low conoid with convex outlines. Whorls 5, slightly convex, the last a little impressed above the keel, the base convex, impressed at the axis. Aperture oblique, the lips thin, basal margin deeply arcuate, columella dilated and reflexed at the insertion.

Alt. 4, diam. 5.3 mm.

Hahajima, Ogasawara. Types No. 83,234, A. N. S. Phila., from No. 865b of Mr. Hirase's collection.

This species resembles *O. chichijimana* in shape, but differs in the

glossy and spirally striate surface, the sculpture of the two species being quite different.

***Trochomorpha cultrata iheyaensis* n. subsp.**

Shell much larger than *cultrata*, of a very pale brownish-buff tint, granulation excessively minute; umbilical keel strong.

Alt. 8.7, diam. 24.3 mm.; diam. umbilicus (measured from its bounding keel) 9.7 mm. Whorls 7.

Iheyajima, Ryukyu. Types No. 89,932, A. N. S. Phila., from No. 631c of Mr. Hirase's collection.

***Trochomorpha cultrata oshima* n. subsp.**

Shell smaller than *cultrata*, chestnut brown, not perceptibly granulose; strongly angular around the umbilicus but not keeled. Whorls more numerous, 7 or $7\frac{1}{4}$, *slightly projecting above the sutures*, the last acutely carinate.

Alt. 5.2, diam. 15 mm.; diam. of umbilicus (measured from the bounding angle) 5.6 mm.

Ōshima, Ōsumi. Types No. 89,936, A. N. S. Phila., from No. 1,334 of Mr. Hirase's collection.

Ten specimens of this very distinct race were taken.

***Macrochlamys kumeensis* n. sp.**

Shell perforate, depressed, thin, brown, somewhat glossy, weakly striatulate, without spiral striæ. Spire low conoidal. Whorls 5, convex, slowly increasing, the last much wider, rounded peripherally, convex beneath, impressed around the axis. Aperture slightly oblique, lunate; columella oblique, strengthened with a slight callus inside.

Alt. 3.8, diam. 6 mm.

Kumejima, Ryukyu. Types No. 90,250, A. N. S. Phila., from No. 1,357 of Mr. Hirase's collection.

Only six specimens of this species were taken. It is a compact little snail, with low growth-wrinkles but no spiral striæ.

***Microcystina acuta* n. sp.**

Shell low-conic, resembling *M. ceratodes* in general shape; minutely perforate, thin, brownish-yellow, very glossy, sculptured with low growth-wrinkles only. Spire convexly conic with obtuse apex. Whorls $5\frac{1}{2}$, convex, slowly increasing, parted by an impressed suture, very narrowly margined above. Last whorl acutely carinate, the keel narrow, becoming weaker on the latter part of the whorl. Base convex. Aperture lunate, the columella thickened with a white callus, abruptly dilated at the insertion, half covering the perforation.

Alt. 4.6, diam. 6 mm.

Ichikimura, Satsuma. Types No. 90,076, A. N. S. Phila., from No. 1,325 of Mr. Hirase's collection.

This species resembles *Microcystina ceratodes* (Gude) in shape. It is a much larger form, with the keel weak or subobsolete just behind the lip.

***Microcystina hakonensis* n. sp.**

Shell minutely perforate, low-conic above, convex below, the periphery angular, becoming rounded near the aperture. Surface glossy, rather weakly, distantly striatulate above, smooth below. Whorls $5\frac{1}{2}$, convex, with well impressed suture, the last angular in front, becoming rounded on the last third. Base convex, impressed in the middle. Aperture lunate. Peristome thin, the columella reflexed above, internally a little irregular, but not distinctly thickened.

Alt. 4, diam. 6 mm.

Hakone, Sagami. Types No. 90,221, A. N. S. Phila., from No. 1,315 of Mr. Hirase's collection.

This form, of which but 8 specimens have been received, differs from *Kaliella gudei* by the angular, not acutely carinate periphery. It has no vertical striation or spiral lines.

***Microcystina edgariana* n. sp.**

Shell minutely perforate, with convexly low-conic spire and convex base, the periphery obsoletely angular in front; yellowish, somewhat transparent, very glossy. Surface irregularly, weakly marked with growth-wrinkles, but without spiral striation. Whorls $5\frac{1}{2}$, convex, slowly increasing, parted by a well-impressed suture, the last indistinctly angular in front, its later half rounded peripherally. Aperture lunate. Columellar lip narrowly reflexed above, sloping, thickened within.

Alt. 3.6, diam. 5 mm.

Ikejijima, Ōsumi. Types No. 90,219, A. N. S. Phila., from No. 1,327 of Mr. Hirase's collection.

This species stands near *M. vaga* P. and H., but it is more depressed, larger, with a half whorl less. It resembles *Macrochlamys* (?) *gudei* in color, texture and form, but that is a very much larger species. Only seven specimens of *M. edgariana* were taken. Named in honor of Mr. Edgar A. Smith.

***Microcystina kumejimana* n. sp.**

Shell minutely perforate, with low conoid spire, rounded periphery and convex base; thin, yellowish, somewhat translucent and brilliantly glossy. Surface showing rather coarse radial grooves, irregularly

spaced above, the base delicately engraved with very minute spiral lines. Apex obtuse, whorls $4\frac{1}{2}$, slightly convex, a little impressed below the suture. Aperture lunate, the columellar margin dilated above, thickened within.

Alt. 2.25, diam. 3.8 mm.

Kumejima, Ryukyu. Types No. 90,222, A. N. S. Phila., from No. 1,358 of Mr. Hirase's collection.

Much larger than *M. sinapidium* or *M. radiata*, which seem to be the most closely related species.

***Microcystina hokkaidonis* n. sp.**

Shell minutely perforate, depressed, with low, conically convex upper surface, convex base, and rounded periphery; yellowish, somewhat transparent, thin and glossy. Surface marked with very slight growth lines; under a strong magnification showing a weak very fine radial striation, in places, on the spire. Whorls $4\frac{1}{2}$, moderately convex; suture well impressed; aperture rather broadly lunate, oblique, the columellar margin reflexed close to its insertion scarcely thickened within.

Alt. 3.5, diam. 5 mm.

Kayabe, Ojima. Types No. 87,925, A. N. S. Phila., from No. 1,043 of Mr. Hirase's collection.

The second whorl, and sometimes several others, have a sculpture recalling *Kaliella*, but excessively minute.

***Kaliella licoonus* n. sp.**

Shell minutely perforate, trochiform, the spire conic, base convex, periphery acutely angular, becoming rounded at the lip; base convex; thin, yellow, somewhat transparent and very glossy. Sculpture of irregular rather close but not very strong wrinkles of growth. Spire low-conic with straight lateral outlines and obtuse apex. Whorls $5\frac{1}{2}$, convex, separated by an impressed suture. The first half whorl is smooth, the next whorl finely striate vertically, the rest with growth-wrinkles as described above, the last whorl very acutely angular in front, the angle disappearing gradually on the last third, leaving it rounded near the outer lip in full-grown shells. Aperture lunate-truncate. Columella vertical, the margin triangularly dilated near the insertion.

Alt. 4, diam. 5 mm.

Yutagawa, Uzen. Types No. 90,226, A. N. S. Phila., from No. 1,313 of Mr. Hirase's collection.

This species is closely related to *K. okinoshimana*, but that is acutely

carinate throughout. It differs from *K. ceratodes* in the sculpture of the early whorls as well as by the less developed peripheral keel.

***K. lieconus goniozona* n. subsp.**

This form of the species is smaller, alt. 3.6, diam. 4.1 mm., a trifle higher in proportion, with 6 whorls.

Amagisan, Izu. Types No. 90,227, A. N. S. Phila., from No. 1,314 of Mr. Hirase's collection.

About a dozen specimens were taken.

***Kaliella affinis* n. sp.**

Shell minutely perforate, low-trochiform, thin, yellowish-corneous, subtranslucent. Surface glossy, the base smooth, upper surface faintly striolate vertically, especially the earlier whorls. Spire conic, the apex obtuse, lateral outlines a trifle convex, nearly straight. Whorls $5\frac{1}{2}$, very convex, the last with a narrow, acute peripheral keel. Aperture truncate-lunate, the columellar margin dilated above, slightly thickened within.

Alt. 2, diam. 2.6 mm.

Harutori and Akkeshi, Kushiro. Cotypes No. 90,228 and 90,229, A. N. S. Phila., from No. 1,145 and 1,145a of Mr. Hirase's collection.

This specimen is more depressed than *K. harimensis*, and more carinate. *K. hachijoensis* has not the faint vertical striation of *affinis*. In shape it is much like the larger *K. humiliconus*. *Microcystina higashiyamana* differs by its glossy upper surface, without vertical striation.

***Kaliella crenulata basistriata* n. subsp.**

Shell similar to *K. crenulata* but larger, with the base radially thread-striate like the upper surface.

Alt. 4.2, diam. 4 mm., whorls 7.

Alt. 3.7, diam. 3.3 mm., whorls $6\frac{1}{2}$.

Yakushima, Ōsumi. Types No. 87,934, A. N. S. Phila., from No. 1,283 of Mr. Hirase's collection.

In *K. crenulata* the base is smooth, and that species has not been found in Kyushu or southward up to this time.

ENDODONTIDÆ.

***Punctum boreale* n. sp.**

Shell depressed, umbilicate, dark brown, thin, dull; whorls $3\frac{1}{2}$, the first $1\frac{1}{2}$ smooth, the rest with oblique, coarse, widely, irregularly spaced wrinkle-like ribs, the intervals and ribs finely striate spirally. Whorls convex, the last rounded peripherally and below. Umbilicus some-

what smaller than the aperture. Aperture oblique, rounded, about one-fourth of the circle excised at the parietal margin.

Alt. 1, diam. 2.1 mm.; width of umbilicus 0.6, of aperture 1 mm.

Akkeshi, Kushiro. Types No. 90,230 A. N. S. Phila. from No. 1,309 of Mr. Hirase's collection.

This species differs from *P. amblygona* Reinh. by its rounded periphery. It is also related to the southern *P. rota*.

PUPILLIDÆ.

***Vertigo hirasei kushiroensis* n. subsp.**

Differs from *V. hirasei* Pils. by being larger, more solid, brown, with a strong pale ridge or crest a short distance behind the outer lip. It is not as wide and swollen as *V. h. hachijoensis*. The typical four teeth are developed.

Length 1.8, diam. 1 mm.

Akkeshi, Kushiro. Types No. 90,223, A. N. S. Phila., from No. 1,310 of Mr. Hirase's collection.

Vertigo hirasei in some of its varieties will probably be found throughout Japan, since the type came from Kyushu, while the form described above is from northern Yesso, and another subspecies occurs in the islands of Izu.

ACHATINELLIDÆ.

***Tornatellina ruouana* n. sp.**

Shell imperforate, ovate-conic, thin, pale brown, lightly striatulate, glossy. Spire conic; whorls $4\frac{1}{2}$, convex. Aperture oblique, ovate. Outer lip thin and simple. Columella convex and somewhat callous above; parietal lamella well developed, long.

Alt. 3.3, diam. 1.9 mm.

Kerama-jima, Ryukyu. Types No. 89,891, A. N. S. Phila., from No. 1,360 of Mr. Hirase's collection.

This is a wider shell than *T. triplicata*, and the young do not have internal varices or a triplicate columella. It is the first imperforate *Tornatellina* found in the Ryukyu Islands.

AURICULIDÆ.

***Cassidula labrella japonica* n. subsp.**

Shell imperforate, oval with conic spire, solid, dark brown. The whorls of the spire have a groove defining a rather wide subsutural border, and rarely several weak spirals below it. The last whorl is very finely striate spirally, the most strongly sculptured specimens

with some deeper, punctate striae among the others; *all the striae being very weak* or even obsolete. Whorls $7\frac{1}{2}$ to 8, nearly flat. Some inconspicuous, slightly paler variceal streaks are visible on the spire. The last whorl has a narrow and often very low crest close behind the outer lip, and the usual keel or cord at the base, defining a small umbilical area. Aperture including peristome seven-twelfths the length of the shell, regularly ovate, slightly oblique. Peristome nearly white; outer lip with a strong internal callus, excised above as usual, and either even-edged or weakly two-toothed near the upper end. Inner lip with three folds, the lower two entering, not emerging to the lip-edge, the upper parietal fold small and tubercular, not longitudinal, sometimes wanting.

Length 13, diam. 7.3 mm., length aperture 8 mm.

Length 12, diam. 6.9 mm., length aperture 7.4 mm.

Nishigo, Uzen. Types No. 78,767, A. N. S. Phila., from No. 407 of Mr. Hirase's marine shell collection.

C. labrella, described from the Isle of France, is a more strongly striate shell with larger aperture. The present form is almost smooth, the striae scarcely being discernible in most specimens. *C. plecotrematoides* Mldff. is more strongly striate, with the upper parietal tooth and the two on the lip-callus better developed.

I am disposed to consider both the Japanese form described above and the Chinese *C. plecotrematoides* as subspecies of *C. labrella*; but if the Chinese form be separated specifically, then *C. l. japonica* will be referred to it as a subspecies.

***Cassidula paludosa nigrobrunnea* n. subsp.**

Similar to *C. paludosa* Garrett, but the parietal denticle is better developed than usual in that species; the color is deep chocolate brown, with a blackish line below the suture.

Length 10, diam. 6 mm.; length of aperture 6.3 mm.

Length 9, diam. 5.2 mm.

Length 7.2, diam. 5 mm.

Kunchan, Ryukyu. Types No. 89,973, A. N. S. Phila., from No. 1,345 of Mr. Hirase's collection.

This little *Cassidula* has the egg-like shape and high lip-crest of the Vitian *C. paludosa*, of which the types are before me; but that is, so far as known, invariably yellow or light brown in color.